

中国紫堇属糙果紫堇组的研究

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糙果紫堇组 (Sect. *Trachycarpae*) 是 Fedde 于 1924 年建立的, 组模式种: 糙果紫堇 *Corydalis trachycarpa* Maxim.

一、形态特征

小草本; 须根多数成簇, 棒状肉质增粗; 茎若干, 上部分枝或具少数分枝, 下部无叶, 向基部渐狭成丝状; 基生叶少数, 具长柄, 叶片三回 (稀二回) 羽状分裂, 茎生叶通常 2—4 枚, 具短柄至无柄, 通常生于茎上部; 总状花序顶生, 大多密集多花, 具扇状羽裂或掌状分裂的苞片, 苞片大多长于花梗; 花较大, 通常具长的距, 外花瓣明显具鸡冠状突起。

二、系统排列

系 1. 糙果紫堇系 新系

Ser. 1. *Trachycarpae* C. Y. Wu et H. Chuang, ser. nov.

Ovarium vel capsula longitudinaliter 6-striatum, striis e tuberculis numerosis dense dispositis.

子房、蒴果具多数小瘤密集排列成 6 条纵纹。

系的模式: 糙果紫堇 *C. trachycarpa* Maxim.

1. 糙果紫堇

Corydalis trachycarpa Maxim. in Bull. Acad. Petersb. 24:27. 1878; Fl. Tangut. 1:42, tab. 10, fig. 16-23. 1889; Hand. -Mazz. Symb. Sin. 7:347. 1931; Rehd. et Kobuski in Journ. Arn. Arb. 14:16. 1933, nom. tantum; Fedde in Engl. et Prantl. Pfl. -fam. Aufl. II /17b:128. 1936; 中国高等植物图鉴 2:16, 图 1972. 1972. *Corydalis trachycarpa* var. *szechuanica* Fedde in Fedde Rep. 20:286. 1924, syn. nov.

1a. 糙果紫堇

var. *trachycarpa*

甘肃: 夏河, 傅坤俊1303; 拉卜楞, 王作宾7293。青海: 互助, 郭本兆9355, 朱兆仪等84; 天俊, 郭本兆11425; 门源, 钟补求8982, 周兴民302; 祁连, 钟补求8682; 柴达木, 青甘队632; 同仁, 郭本兆10341; 魏振铎584; 共和, 郭本兆11842; 西宁, 秦仁昌658。四川: 康定, 刘振书1516; 巴塘, 四川生物所1646; 乡城, 四川生物所1510、1201、3197; 稻城, 四川生物所3775; 木里, 俞德浚6449; 大金, 李馨77773、78193。云南: 德钦, 王启无64928、69655、70152, 俞德浚9194、9303, 冯国楣6126, Rock 10326, 杨竞生8835; 中甸, 俞德浚12238、12464、12736、12795, 冯国楣1498, 杨竞生8184、8259、8461、8917。西藏: 比如, 青藏队11313; 昌都至类乌齐(杂申山哑口), 吴征镒等5017; 江达, 贾慎修368。

分布于甘肃西南部、青海、四川西部、云南西北部、西藏东北部, 生于海拔2700—5200米的高山草甸、灌丛下、流石滩。模式标本采自甘肃。

1b. 小糙果紫堇 新变种

var. *nana* C. Y. Wu et H. Chuang, var. nov.

A var. *trachycarpa* Maxim. differt plantis humilioribus, 8—10 cm altis.

与原变种的区别在于植株矮小, 高仅8—10厘米。

甘肃(Gansu): 嘉峪关(Jiayuguan), 王庆瑞(C. R. Wang) 6305 (模式! 藏甘肃师范大学, Typus! LZTU.)。

分布于甘肃嘉峪关, 生于海拔3900米左右的草地、沼泽。

2. 灰岩紫堇 新拟

Corydalis calcicola W. W. Smith in Notes Bot. Gard. Edinb. 8:184. 1914; Hand. -Mazz. Symb. Sin. 7:347. 1931; Fedde in Engl. et Prantl. Pfl. -fam. Aufl. II /17b; 129. 1936.

云南: 丽江, 秦仁昌21263, 王汉臣321。

分布于云南西北部(丽江), 生于海拔3000—3300米的石灰岩流石滩。模式标本采自丽江。

3. 高山紫堇 “甲多网巴”(藏语) 新种 图1, 1—4

Corydalis alpigena C. Y. Wu et H. Chuang, sp. nov. — *Corydalis trachycarpa* auct. non Maxim.; Rehd. et Kobuski in Journ. Arn. Arb. 14:16. 1933.

Species *C. trachycarpae* Maxim. similis, a qua differt floribus luteis, appendicibus staminalibus brevioribus, plantis saepe simplicibus.

Herba perennis, 15—20 cm alta. Radices numerosae fasciculatae clavatae, 3—5 cm longae, infime subito filiformiter angustatae. Caules 1—6, superne robusti, foliati, raro ramigeri, inferne nudi, basi filiformes. Folia basalia pauca, 6—8 cm longa, petiolis 4—6 cm longis, prope basin filiformibus, laminis ambitu ovatis, tripinnatis, segmentis primariis 4—5-jugis, oppositis, inferne breviter

petiolulatis, superne sessilibus, pinnatisectis vel pinnatipartitis, lobis sessilibus, 2—3-partitis vel fidis, lobulis anguste ellipticis vel oblongis, apice acutis, subtus glaucescentibus; caulina saepe 3(4), ad caulem medio approximate alterna, interdum super distantia, ceterum radicalibus similia, sed petiolis brevioribus. Racemi terminales dense multiflori, 3—6 cm longi; bracteae inferne flabellatae, bipinnatisectae, superne flabellatae palmatisectae; pedicelli paullo robusti, bracteis breviores. Sepala squamiformia inciso-dentata; petalum superius circ. 3 cm longum, limbo naviculiformi-ovato, obtuso, margine repando, dorso cristato circ. 2 mm alto, calcar conico, deorsum arcuato, $2/3$ totius petali occupante; petalum inferius naviculiformi-oblongum, 1.1—1.2 cm longum, dorso cristatum altum; petala interiora panduriformia, limbis obovatis, saccis lateralibus, cristatis brevioribus, supra purpuratis, unguibus anguste cuneatis, limbis aequilongis; stamina 0.8—0.9 cm longa, antherae parvae; filamenta anguste elliptica; appendix $1/4$ calcaris percurrens; ovarium anguste ellipticum, 2.5—3 mm longum, ovulis biseriatis; stylus 3.5—4.5 mm longus; stigmata binata obovata, supra 2 papillata. Capsula (immatura) anguste elliptica, longitudinaliter 6-striatum, striis e tuberculis numerosis dense dispositis.



图 1 1—4. 高山紫堇 *Corydalis alpigena* C. Y. Wu et H. Chuang, 1. 植株; 2. 花外形; 3. 雌蕊; 4. 子房。
5—6. 白穗紫堇 *Corydalis leucostachya* C. Y. Wu et H. Chuang, 5. 植株; 6. 花外形。(李锡畴绘)

青海 (Qinghai): 东北部 (E. -N. hab.?), Rock 14380 (模式! 藏北京植物所, Typus! PE.), 14400, 14155; 玉树 (Yushu), 杨永昌 (Y. C. Yang) 652. 四川 (Sichuan): 德格 (Dege), 四川植物标本 (Sichuan plant. spec.) 7294, 石渠 (Serxü), 同上 (ib.) 15155.

分布于青海和四川西北部, 生于海拔4000—4500米的高山草甸。

本种接近糙果紫堇 *C. trachycarpa* Maxim., 但花黄色, 雄蕊蜜腺体较短, 植株通常不分枝。

4. 白穗紫堇 新种 图 1, 5—6

Corydalis leucostachya C. Y. Wu et H. Chuang, sp. nov.

Species similis *C. trachycarpae* Maxim., sed caulibus robustioribus, inflorescentiis dense multifloris, pedicellis brevioribus quam bracteis, floribus albis, petalis externis cristatis altioribus, petalis inferioribus subter saccatis, petalis interioribus apice atrobrunneis differt.

Herba glabra, 15—20 cm alta. Radices numerosae fasciculatae clavatae, usque 10 cm longae, circ. 0.5 cm crassae. Caules 1—4, superne robusti et foliati, raro ramigeri, inferne nudi attenuati, prope basin filiformes. Folia basalia pauca, petiolis 12—15 cm longis prope basin filiformibus, laminis ambitu ovatis 3—3.5 cm longis, bipinnatis, sectis primariis petiolulatis, secundariis sessilibus, lobulis anguste lanceolatis vel anguste oblongis, supra viridibus, subtus pruinosis; caulina 3—4, inferiora longipetiolata, superiora brevipetiolata, ceterum basalibus similia. Racemi terminales, 5—7 cm longi, dense multiflori; bractee palmati-sectae vel -partitae, lobis linearibus; pedicelli valde breviores quam bractee, et quibus tectis. Flores albi; sepala squamiformia caduca, petalum superius circ. 2.5 cm longum, limbo cymbiformi-ovato, acuminato, crista circ. 2 mm alta, ab apice ad finem limborum producta, calcar conico, 3/5 totius petali occupante, infime decurvo; petalum inferius circ. 1.1 cm longum, cristatum petalo superiore similis, in medio leviter constrictum, subter saccatum; petala interiora circ. 1 cm longa, limbis obovatis, apice orbicularibus et atrobrunneis sacculis lateralibus, basi truncatis, unguibus anguste cuneatis, limbis subaequilongis; stamina circ. 0.8 cm longa; antherae parvae; filamenta anguste lanceolata; appendix 2/5 calcaris percurrens; ovarium anguste ellipticum, circ. 0.3 cm longum, tuberculis densis longitudinaliter striatis, ovulis baserialibus; stylus longior quam ovarium; stigmata binata obovata, supra 2-papillata. Capsula ignota.

青海 (Qinghai): 杂多 (Zadoi), 刘尚武 (S. W. Liu) 143 (模式: 藏北京植物所生态室, Typus! PE. -Veg.)。

分布于青海南部, 生于海拔4300米左右的河岸阶地阳坡。

本种近糙果紫堇 *C. trachycarpa* Maxim., 但茎较粗壮, 花序密集多花, 花梗较苞片

短，花白色，外花瓣鸡冠较高，下花瓣下部呈囊状，内花瓣先端黑褐色。

系2.平果紫堇系 新系

Ser. 2. *Kokianae* C. Y. Wu et H. Chuang, ser. nov.

Ovarium capsulaque saepe laeve; folia glabra.

子房、蒴果通常平滑；叶光滑。

系的模式：狭距紫堇 *C. kokiana* Hand. -Mazz.

5.狭距紫堇

Corydalis kokiana Hand. -Mazz. in Anz. Akad. Wiss., Wien, Math. -Nat. 57:52. 1920 et Symb. Sin. 7:348. tab. 7, 10—11. 1931.

5a.狭距紫堇

var. *kokiana*

四川：乾宁，郭本兆20826；康定，关克俭、王文采736；木里，吕正伟1062。云南：德钦，俞德浚8776、9076、9491、10154；维西，俞德浚2869；中甸，冯国栋1497，中甸队1671、63—2831、63—3172，杨竞生8187，俞德浚11698。

分布于四川西部、云南西北部，生于海拔3100—4200米的林下，灌丛中或草地。模式标本采自中甸。

5b.小花狭距紫堇 新变种

var. *micrantha* C. Y. Wu et H. Chuang, var. nov.

A var. *kokiana* differt floribus minoribus gracilibusque circ. 1 cm longis.

本变种与原变种的区别在于花较小，纤细，长约1厘米。

四川 (Sichuan)：乡城 (Xiangcheng)，四川生物所 (CDBI.) 1010 (模式！藏四川生物所，Typus! CDBI.)。

分布于四川西南部，生于海拔3850米的灌丛中。

5c.粗壮狭距紫堇 新变种

var. *robusta* C. Y. Wu et H. Chuang, var. nov.

A var. *kokiana* abhorret plantis robustioribus.

本变种与原变种的区别在于植株较粗壮。

四川 (Sichuan)：德格 (Dege)，四川植物标本 (Sichuan plant. spec.) 7100。西藏 (Xizang)：左贡 (Zogang)，青藏科考队 (Qinghai-Xizang. Exp.) 12066 (模式！藏北京植物所，Typus! PE.)；八宿 (Baxoi)，同上 (ib.) 12205；察雅 (Chagyab)，同上 (ib.) 12254；类乌齐 (Riwoqe)，吴征镒等 (C. Y. Wu et al.) 4790；宁静 (Ningjing)，萧培根 (P. K. Hsiao) 1239。

分布于四川西北部、西藏东部，生于海拔3600—4000米的林缘或山坡灌丛下。

6.变色紫堇 新种 图2, 1—2

Corydalis varicolor C. Y. Wu, sp. nov.

Species *C. kokianae* Hand. -Mazz. arcte affinis, sed caulibus simplicibus, foliis caulinis 1; lobis foliorum apice orbiculatis vel obtusis; pedicellis bracteis subaequilongis; floribus varicoloribus, stylis brevioribus differt.



图2 1—2.变色紫堇 *Corydalis variicolor* C. Y. Wu et H. Chuang, 1.植株; 2.花外形。
3—8.洛隆紫堇 *Corydalis lhorongensis* C. Y. Wu et H. Chuang, 3.植株上部; 4.植株下部; 5.花
外形; 6.雌蕊; 7.雄蕊; 8.萼片。(肖溶绘)

Herba glabra, 15—28 cm alta. Radices numerosae fasciculatae, clavatae, 5—10 cm longae, circ. 2 mm crassae, deorsum gradatim graciles, infra paucae ramosae fibrosae. Caules graciles et simplices, praeter summum nudi, ad basem filiformes. Folia basalia pauca, petiolis circ. 4 cm longis, laminis ambitu ovatis, 3.5—4 cm longis, tripinnatis, segmentis primariis 2-jugis petiolulatis brevioribus, secundariis subsessilibus vel sessilibus, ultimis oblanceolatis vel obovatis, 3—5 mm longis, apice orbiculatis vel obtusis, utrinque glaucis; folium caulinum 1, sub inflorescentia emittens, petiolo brevior, lamina basalibus similia sed minoria. Racemi terminales, circ. 5 cm longi, circ. 15-flori, supra densi et suatius laxi, bracteae infimae foliis caulinis similes, lobis sursum deminutis, summum anguste lanceolatis integris, pedicelli erecti, bracteis subaequilongi. Flores varicolores, primo luteoli post luteolopurpurati demum purpureo-rubescnti; sepala minima membranacea subtriangularia; petalum superius circ. 1.8 cm longum, limbo naviculiformi-ovato, apice primo virido post purpurato, dorso cristato 1—

1.5 mm alto, calcari cylindrico, limbo subaequilongo, infime paullo decurvato; petalum inferius circ. 1.2 cm longum, limbo subrhomboideo, cristato parvo, ungue anguste cuneato, limbo subaequilongo; petala interiora circ. 1 cm longa, limbis suborbiculatis, supra purpuratis, sacculis lateralibus, unguis gracilibus, longioribus quam limbis; stamina circ. 0.9 cm longa; filamenta late linearia; antherae minime ovatae; appendix 1/2 calcaris percurrens; ovarium cylindricum, circ. 0.6 cm longum, ovulis numerosis biserialibus, stylo brevius, stigmate binato obovato, subter 2-papillato. Capsula ignota.

青海 (Qinghai) : 玉树 (Yushu) , 藏药队 (Qinghai-Xizang-Yao Exp.) 1230 (模式! 藏北京植物所, Typus! PE.)

分布于青海南部, 生于海拔3800米左右。

本种极似狭距紫堇 *C. kokiana* Hand. -Mazz., 但本种以茎不分枝, 茎生叶仅1枚; 叶裂片圆钝; 花梗与苞片近等长; 花颜色多变, 花柱短与之区别。

7. 洛隆紫堇 新种 图2, 3—8

Corydalis lhorongensis C. Y. Wu et H. Chuang, sp. nov.

Species *C. Kokianae* Hand. -Mazz. similis, a qua differt radicibus clavatis petiolis 2—5 cm longis, floribus purpureoroseis, appendicibus brevioribus.

Herbae glabrae, 45—55 cm altae. Radices multo fasciculatae, anguste fusiformi-clavatae incrassatae, circ. 4 cm longae, 0.2—0.3 cm crassae, petiolis 2—5 cm longis, suffultae, in sicco brunneae. Caules 2—3, superne ramosi vel simplices, inferne nudi, prope basin filamentosi. Folia radicalia pauca, petiolis 13—27 cm longis gracilibus, prope basin filamentosis, laminis ambitu oblongis, 6—10 cm longis, 2—3-pinnatis, segmentis primariis 4—8-jugis, subtus pctiolulatis, superne subsessilibus, 2—7-sectis vel -partitis, ultimis anguste ellipticis vel anguste lanceolatis, apice attenuatis, supra viridibus, subtus pruinosis; caulina 2—3, ad caulem supra distantia alternantia, inferne breviter petiolata, superne sessilia, laminis ambitu ovatis, cetero foliis basalibus conformibus, sed minoribus. Racemi terminales lateralesque, 3.5—7 cm longi, dense multiflori; bracteae infimae foliis caulinis superioribus conformes, superne pinnatae 3—5-fidae, summe lineari-oblongae vel lineares; pedicelli bracteis subaequilongi. Flores purpurco-rosei; sepala squamiformia, margine lacera; petalum superius circ. 2 cm longum, limbo cymbiformi-ovato, apice obtuso, cristato circ. 1 mm alto, ab apice ad finem limbi producto, calcari cylindrato, paullo declinato, limbo subaequilongo; petalum inferius cymbiformi-oblongum, circ. 1.1 cm longum, ex ungue, cristatum petalis superioribus conformis, sed brevior; petala interiora circ. 0.9 cm longa, limbis obovato-oblongis, sacculis lateralibus, unguibus anguste cuneatis, limbis subaequilongis; stamina circ. 0.8 cm longa; antherae parvae; filamenta anguste lanceolata; appendix 1/3 calcarium percurrens; ovarium anguste

ellipticum, circ. 0.3 cm longum, longitudinaliter angulatum, ovulis numerosis, stylus ovario longior, stigmata binata obovata, supra 2-papillata. Capsula ignota.

西藏(Xizang): 洛隆(Lhorong), 青藏队植被组(Qinghai-Xizang Exp.

Veg.) 9030 (模式! 藏北京植物所植被组, Typus! PE. -Veg.)

分布于西藏东部, 生于海拔4400米左右的灌丛下。

本种接近狭距紫堇 *C. kokiana* Hand. -Mazz., 但棒状根具长 2—5 厘米的柄; 花紫红色, 蜜腺体更短。

8. 黑顶黄堇 “省格色把” (藏语) 新种

Corydalis nigro-apiculata C.

Y. Wu, sp. nov.

8a. 黑顶黄堇 图 3, 1—2

var. *nigro-apiculata*

A. C. kokiana Hand. -Mazz. var. *kokiana* arcte affinis, sed floribus luteolis, calcaribus brevioribus quam limbis.

Herba glabra, 15—30 cm alta. Radices fasciculatae, numerosae, clavatae, ad 10 cm longae, deorsum sensim graciles, pauce ramosae fibrosae. Caules 3—8, cylindrici, anguli, superne 1—5 ramosi, inferne nudi sub basi lineales. Folia basalia pauca, petiolis 6—10 cm longis, sub basi linearibus, laminis ambitu late ovatis, 2—7 cm longis, tripinnatis, segmentis primariis 3—4-jugis, petiolulis brevioribus vel subsessilibus, secundariis subsessilibus, 1—2-jugis, 2—3-partitis, lobulis obovatis vel oblongis, apice acutis, mucronatis cartilagineis, subtus glaucis; caulina 3—4, ad caules supra alternantia, subsessilia, cetera basalibus conformia. Racemi 1—5, terminales, 2—10 cm longi, sub fructibus usque 15 cm longi 15—40-flori, densi, bracteae infimae foliis caulinis similes, superiores pinnatae, summae lanceolatae integrae, pedicelli erecti, bracteae longiores. Flores luteoli, sepala minima, suborbiculata, circ. 0.2 mm longa, inaequabile dentato-incisa vel laciniata, membranacea, alba; petalum superius



图 3 1—2. 黑顶黄堇 *Corydalis nigro-apiculata* C. Y. Wu et H. Chuang, 1. 植株; 2. 花外形。
3—4. 心瓣黑顶黄堇 *C. nigro-apiculata* var. *erosipetala* C. Y. Wu et H. Chuang, 3. 花外形; 4. 下花瓣。
5—6. 密穗黄堇 *Corydalis densispica* C. Y. Wu, 5. 植株; 6. 花外形。 (李锡畴绘)

1.7—2 cm longum, limbo scaphoideo-ovato, dorso cristato circ. 1 mm alto, integer, calcar cylindraceo, 0.6—0.8 cm longo, limbo brevius, infime obtusum, paullo decurvum; petalum inferius 0.9—1 cm longum, limbo orbiculato, apice mucronato, dorso humile cristato, ungue late lineari, versus basin acuminati, petala interiora panduriformia, 0.8—0.9 cm longa, apice orbiculata caeruleo-purpurata, unguibus anguste cuneatis, limbo aequilongi; stamina circ. 0.7—0.8 cm longa; filamenta lanceolata, membranacea; antherae parvae, appendix 2/5 calcaris percurrens; ovarium anguste ellipticum, 0.5—0.6 cm longum, ovulis biserialiter; stylus circ. 0.2 cm longus; stigma binata obovata. Capsulae pendulae, teretes, 1.2—1.5 cm longae, 0.2—0.3 cm crassae, angulosae. Semina suborbiculata, circ. 1.5 mm diam. nigra, nitida.

四川 (Sichuan): 甘孜 (Garze), 崔友文 (Y. W. Tsui) 4314. 青海 (Qinghai): 玉树 (Yushu), 杨永昌 (Y. C. Yang) 210. 西藏 (Xizang): 昌都 (Qamdo), 青藏科考队 (Qinghai-Xizang Exp.) 12646, 12691 (模式! 藏昆明植物所, Typus! KUN.), 12705, 12766, 萧培根 (P. K. Hsiao) 2861; 类乌齐 (Riwoqe), 青藏科考队 (Qinghai-Xizang Exp.) 12822, 吴征镒 (C. Y. Wu) 4798, 4866, 青藏队植被组 (Qinghai-Xizang Exp. Veg.) 9212, 萧培根 (P. K. Hsiao) 1770-a; 江达 (Jomda), 张永田、郎楷永 (Y. T. Chang et K. Y. Lan) 182.

分布四川西北部、青海南部、西藏东部, 生于海拔3600—4300米的山坡林下、高山草地或高山沼泽。

本种接近狭距紫堇 *C. kokiana* Hand. -Mazz., 但本种花淡黄色, 距短于花瓣片。

8b. 心瓣黑顶黄堇 新变种 图3, 3—4

var. *erosipetala* C. Y. Wu et H. Chuang, var. nov.

A var. *nigro-apiculata* differt petalis externis margine irregulariter incis, petalo inferiore limbo cordato.

与原变种的区别在于花瓣边缘具不规则的齿缺, 下花瓣片心形。

西藏 (Xizang): 江达 (Jomda), 青藏科考队 (Qinghai-Xizang Exp.) 12403 (模式! 藏昆明植物所, Typus! KUN.)

产西藏东北部, 生于海拔3600米左右的山坡。

9. 密穗黄堇 新种 图3, 5—6

Corydalis densispica C. Y. Wu, sp. nov.

Species affinis *C. kokianae* Hand. -Mazz., sed floribus luteis, calcaribus fere 2/3 petalorum occupantibus, radicibus clavatis, petiolis longis differt.

Herba glabra, 20—40 cm alta. Radices plurimum fasciculatae, clavatae vel fusiformes incrassatae, 2—7 cm longae et 0.2—0.5 cm crassae, longi-stipitatae, in sicco brunneolae, interiore albae. Caules 1—4, simplices vel 1—4-ramosi, superne foliati, inferne nudi, basi filamentosi. Folia basalia 1—5, petiolis 6—8 (—20) cm longis, gracilibus, laminis ambitu late ovatis vel suborbiculatis,

2—3-pinnatis, lobulis anguste ellipticis vel anguste lanceolatis, 1—1.5 cm longis, apice obtusis, supra viridibus, subtus glaucis; caulina 1—5, ad caules supra vel paulo subter alternantis, inferne petiolata usque 3 cm longa, superne brevissima vel subsessila, laminis ambitu late ovatis vel triangularibus, cetero basalibus conformibus, sed subtus majoribus quam basalibus, sursum sensim decrescentibus. Racemi 1—5, terminantes, 3—8 cm longi, 15—30-flori, densi, bracteae infimae foliis caulinis superioribus conformae, medio pinnatae et ligulato-lobae, summum anguste lanceolatae integrae vel incisae; pedicelli bracteis subaequilongi. Flores lutei, sepala parva, squamiformia, albo-membranacea suborbiculata et margine lacera; petalum superius 1.8—2 cm longum, limbo ovato, dorso cristato alto, ex apice ad finem limborum evanescentibus, calcar cylindrico, 1.2—1.3 cm longo, fere 2/3 petalorum occupante, ad fines paulo declinato; petalum inferius obovatum, 0.8—0.9 cm longum, dorso cristatum usque 2.5 mm altum; petala interiora panduriformia, 0.6—0.7 cm longa, limbis apice orbicularibus, sacculis lateralibus, unguibus circ. 2.5 mm longis, deorsum attenuatis; stamina circ. 0.6 cm longa, filamentis lanceolatis, antheris minimis et oblongis, appendice 2/5 calcaris percurrente; ovarium ellipticum, 0.2—0.3 cm longum, ovulis numerosis, biseriatis, stylo gracili, 0.3—0.4 cm longo, stigmate binato obovato, supra 2-papillato. Capsula elliptica, circ. 1 cm longa et circ. 0.3 cm crassa, e basibus stipitatis decurvata. Semina suborbiculata, circ. 1.5 diam., nigra et leviter nitida, appendicibus cristatis.

四川 (Sichuan): 九龙 (Jiulong), 俞德浚 (T. T. Yü) 6904; 木里 (Mili), 俞德浚 (T. T. Yü) 6523; 稻城 (Daocheng), 四川植被调查队 (Sichuan Veg. Exp.) 0378, 1801, 2200; 乡城 (Xiangcheng), 四川植被调查队 (Sichuan Veg. Exp.) 1032, 1234; 德格 (Dege), 四川植被调查队 (Sichuan Veg. Exp.) 738. 云南 (Yunnan): 维西 (Weixi), 俞德浚 (T. T. Yü) 8807; 德钦 (Deqen), 俞德浚 (T. T. Yü) 9146, 9709, 9839, 杨竞生 (J. S. Yang) 8895; 中甸 (Zhongdian), 俞德浚 (T. T. Yü) 11968 (模式! 藏昆明植物所, Typus! KUN.), 12229, 吴征镒 (C. Y. Wu) 4319; 西藏 (Xizang): 察隅 (Zayü), 青藏队 (Qinghai-Xizang Exp.) 73-372; 八宿 (Baxoi), 青藏队 (Qinghai-Xizang Exp.) 73-1145a.

分布于四川西南部、云南西北部、西藏东南部, 生于海拔3200—4200米的草坡、灌丛下或林下。

本种近狭距紫堇 *C. kokiana* Hand.-Mazz., 但花黄色, 距长为花瓣片的2倍, 棒状根具长柄。

10. 紫花紫堇 新种 图4, 1—2

Corydalis porphyrantha C. Y. Wu, sp. nov.

Species *C. kokinae* Hand.-Mazz. similis, a qua differt floribus atropurpureis majoribus, petalis superioribus circ. 2.5 cm longis, calcaribus 2/3 petal-

lorum occupantibus.

Herba glabra, 30—50 cm alta. Radices paullo carnosulae, fasciculatae, anguste teretes, 7—9 cm longae, tota aequicrassae. Caules teretes, perspicue longitudinali-angulati, multiramosi. Folia radicalia pauca, petiolis usque 18 cm longis, laminis late ovatis, circ. 13 cm longis et 10 cm latis, tripinnatis, segmentis primariis 3-jugis, petiolulis longioribus, distantibus, secundariis 2-jugis, petiolulis brevioribus vel subsessilibus, distantibus tertiariis ellipticis, 0.7—1.2 cm longis, 0.3—0.6 cm latis, ad apicem mucronulatis, supra viridibus, subtus pruinosis; caulina 3—4 alterna sessilia, laminis ambitu deltoideis, tripinnatis, segmentis primariis 2—3-jugis, distantibus inferne petiolatis, superne sessilibus, ceterum conformibus. Racemi multiflori, 2—6 cm longi, bracteae inferiores flabellato-sectae, superior lanceolatae, dentatae, summum subulatae; pedicelli graciles, bracteis breviori; sepala parva, orbiculata, profunda lacera; flores atro purpurei, petalo superio circ. 2.5 cm longo, limbo ovato, dorso humilior cristato, calcar cylindrico, circ. 1.6 cm longo, apice obtuso, petalo inferio subrhombico, circ. 0.8 cm longo, dorso minute cristato, petalis interioribus anguste obovatis, circ. 0.7 cm longis, unguibus circ. 0.3 cm longis; filamenta anguste ovata, circ. 0.4 cm longa, membranacea, antheris ovatis, appendice $2/5$ calcaris percurrente; ovarium anguste obovatum, circ. 0.3 cm longum, ovulis biseriatis, stylo gracili circ. 0.3 cm longo, stigmate sub binato obovato. Capsula ignota.

云南(Yunnan): 贡山 (Gongshan), 俞德浚 (T. T. Yu) 19715 (模式! 藏昆明植物所, Typus! KUN.)。

分布于云南西北部, 生于海拔3500米左右的山坡草地。

本种接近狭距紫堇 *C. kokiana* Hand.-Mazz., 但花深紫色, 上花瓣长约2.5厘米, 距占上花瓣长的 $2/3$ 。



图4 1—2. 紫花紫堇 *Corydalis porphyrantha*

C. Y. Wu, 1. 植株上部; 2. 花外形。

3—5. 拟昌都紫堇 *Corydalis deflexi-calcarata*

C. Y. Wu, 3. 植株; 4. 花外形; 5. 柱头和花柱。(张宝福绘)

11. 拟昌都紫堇 新种 图 4, 3—5

Corydalis deflexi-calcarata C. Y. Wu, sp. nov.

Species in habitu, inflorescentiis bracteisque, etiam petalis inferioribus subtus saccatis a *C. chamdoensis* C. Y. Wu et H. Chuang similis, a qua differt floribus violaceo-brunneis, petalis externis cristatis humilioribus, calcaribus gracilioribus.

Herba robusta erecta, 10—15 cm alta. Radices clavatae numerosae fasciculatae. Caules 1—5, superne robusti, foliati approximati alterni, in quoque axillis omnino singuli, inferne nudi, prope basin attenuati. Folia radicalia pauca, petiolis circ. 4 cm longis, laminis ambitu ovatis, circ. 2 cm longis, bipinnatis, segmentis primeriis circ. 4-jugis, suboppositis et approximatis, sessilibus, ultimis anguote ellipticis vel anguste obovatis, apice acutis, subtus pruinosis, caulina saepe 2, petiolis brevissimis vel subsessilibus, ceteris radicalibus similis. Racemi terminantes, 3—5 cm longi, dense multiflori, bractee pinnatae, lobis linearibus, pedicelli robusti, breviori quam bractee. Flores violaceobrunnei, sepala squamiformis, margine lacera, petalum superius 2.8—3 cm longum, limbo scaphoideo-ovato, dorso cristato paucio plus quam 0.5 mm alto, calcar conico, deorsum curvo, $\frac{2}{3}$ totius petalium occupante, patelum inferius 1.1—1.2 cm longum, in medio constrictum, inferne saccatum, patela interiora 0.9—1 cm longa, limbis obovatis, sacculis lateralibus, unguibus linearibus, limbis subaequilongis, stamina circ. 0.8 cm longa, antheris parvis, filamentis lanceolatis, appendice $\frac{2}{5}$ calcaris percurrente, ovarium anguste obovatum 0.3—0.4 cm longum, interdum longitudinaliter striatum, striis e tuberculis numerosis dense compositis, sed mox deciduis, ovulis paucis, biserialibus, stylo gracili, ovario multo longiore, stigmate binato obovato, supra 2-papillato. Capsula ignota.

四川 (Sichuan), 道孚 (Dawu), 高宝纯、伍煜庭 (S. B. Kao et Y. T. Wu) 111607 (模式! 藏四川大学, Typus! SZ.)。

分布于四川西部, 生于海拔4400米左右的高山草地。

本种接近昌都紫堇 *C. chamdoensis* C. Y. Wu et H. Chuang, 它们在外形、花序、苞片及下花瓣呈囊状等特征都相似, 唯本种花兰紫褐色, 外花瓣鸡冠状突起较矮, 距较纤细。

12. 昌都紫堇 新种 图 5, 1—4

Corydalis chamdoensis C. Y. Wu et H. Chuang, sp. nov.

Affinis *C. kokiana* Hand. -Mazz., a qua differt plantis robustioribus, floribus luteis majoribus, circ. 2.5 cm longis, calcaribus $\frac{2}{3}$ totius petalorum occupantibus, petalis inferioribus inferne saccatis.

Herba robusta erecta, 20—30 cm alta. Radices numerosae fasciculatae clavatae. Caules 3—5, superne robusti, foliati approximati alterni, in quoque

axiliis omnino ramiferi, inferne nudi, prope basin filiformes. Folia basalia ignota; caulina 3—4, inferiora petiolata circ. 3 cm longa, superiora petiolis brevissimis, basi leviter dilatatis vaginalibus, laminis ambitu late ovatis, 6—10 cm longis, tripinnatis, segmentis primariis 5—6-jugis, suboppositis inferioris longi-petio-distantibus, superioris sessilibus, secundariis breviter petiolulatis vel olulatis, sessilibus, 2—3-partitis vel -fidis, ultimis anguste ellipticis vel oblanceolatis, acutis, omnibus supra perviridibus, subtus glaucescentibus. Racemi usque 8 cm longi, dense multiflori; bracteae inferiore cum caulinis superioribus conformes, bipinnatae, superiore pinnatae, lobis linearibus, pedicelli leviter robusti, bracteis breviori. Flores lutei, sepalis squamiformibus, subcordatis, laceratis, petalo superiore circ. 2.5 cm longo, limbo scaphoidei-ovato, acuto, crista 1—1.5 mm



图5 1—4.昌都紫堇 *Corydalis chamdoensis*
C. Y. Wu et H. Chuang, 1.植株;
2.花外形; 3.雄蕊; 4.雌蕊。
5—10.淡花黄堇 *Corydalis octocornuta*
C. Y. Wu, 5.植株; 6.花外形; 7.花
萼; 8.苞片; 9.雄蕊; 10.雌蕊。
(李锡畴绘)

alta, ex apicem limbi ad medio evanescente emisso, margine inaequaliter inciso, calcar cylindraceo, versus finem leviter attenuato, paullo decurvo, 2/3 totius petali occupante, petalo inferiore scaphoidei-oblongo, circ. 1 cm longo, crista humiliore brevioraque, deorsum saccato, petalis interioribus panduriformibus, circ. 0.8 cm longis, limbis obovatis, lateraliter saccatis, unguibus linearibus, limbis aequilongis, stamina circ. 0.7 cm longa, antheris minimis, filamentis lanceolato-ellipticis, appendice 1/3 calcaris percurrente, ovarium anguste ellipticum, circ. 0.3 cm longum, ovulis circ. 10, biseriatis, stylo brevior, stigmate binato obovato, supra 2 papillato. Capsula ignota.

西藏 (Xizang) : 江达至昌都 (Jomda ad Qamdo), 郭本兆 (P. C. Kuo) 21501 (模式! 藏青海生物所, Typus! NWBI.)

分布于西藏东北部。

本种近狭距紫堇 *C. kokiana* Hand. -Mazz., 但植株较粗壮; 花黄色, 较大, 上花瓣长约 2.5 厘米, 距占上花瓣长的 $\frac{2}{3}$, 下花瓣下部呈囊状。

13. 淡花黄堇 “省格巴格” (藏语) 图 5, 5—10

Corydalis octocornuta C. Y. Wu, sp. nov.

Affinis *C. chamdoensi* C. Y. Wu et H. Chuang, sed floribus luteolis subalbis, calcaribus conicis, petalis externis cristis 2—2.5 mm altis, petalis interioribus apice atropurpureis differt.

Herba glabra, 20—40 cm alta. Planta parte basalibus ignota. Caules paullo graciles, ramosi, versus basin angustetis. Folia caulina 4—6, alterna distantia, petiolis infime usque ad 10 cm longis, summe brevissimis, lamina ambitu anguste ovata et oblonga, infima 5—8 cm longa, sursum decrescentia, tripinnata, segmentis primariis 3—4-jugis, suboppositis, petiolulis brevioribus, secundariis subsessilibus, saepe 3-partitis, lobulis oblongis vel oblongo-ellipticis, acutis, supra viridibus, subter peuinosis, nervis longitudinalibus perspicuis. Racemi multi, terminantes, 3—7 cm longi, sub fructibus elongati usque 10 cm longi, multiflori densi, bracteae inferiores flabelliformi-pinnatisectae, summa lanceolata incisa; pedicelli graciles, bracteis breviori. Flores luteoli subalbi; sepala parva, suborbiculata, profunde lacera; petalum superius 2.5—3 cm longum limbo naviculiformi-ovato, crista 2—2.5 mm alta, ex apice ad medium limbi evanescente, calcari conico, limbo duplo longiore; petalum inferius 1—1.1 cm longum, crista $\frac{1}{3}$ totius limbi occupante, in medio constrictum deorsum saccato; petala interiora panduriformia, 0.9—1 cm longa, limbis obovato-oblongis, apice atropurpureis, lateratiter sacculiferis, prope basin hamato-biauriculatis, dorso cristatis, unguibus anguste cuneatis, limbis aequilongis; stamina 0.7—0.8 cm longa, antheris oblongis, circ. 1 mm longis; filametis ellipticis, supra $\frac{1}{3}$ attenuatis, appendice $\frac{1}{3}$ calcaris percurrente; ovarium anguste obovatum, 0.3—0.4 cm longum, ovulis biseriatis, stylo circ. 0.4 cm longo, stigmatibus binatis obovatis, supra 2-papillato. Capsula (immatura) obovata, angulis, laevis.

西藏 (Xizang): 索县 (Sog Xian), 青藏队 (Qinghai-Xizang Exp.) 11035 (模式! 藏昆明植物所, Typus! KUN.) 11128; 类乌齐 (Riwoqe), 萧培根 (P. K. Shiao) 1770-b; 比如 (Biru), 青藏队 (Qinghai-Xizang Exp.) 11261.

分布于西藏东北部, 生于海拔 4100—4800 米的高山砾石灌丛草地或水边。

本种接近昌都紫堇 *C. chamdoensis* C. Y. Wu et H. Chuang, 但花淡黄近白色, 距圆锥形, 外花瓣鸡冠高 2—2.5 毫米, 内花瓣先端深紫色。

系 3. 糙叶紫堇系 新系

Ser. 3. *Scaberulae* C. Y. Wu et H. Chuang, ser. nov.

Ovarium capsulaque laevis, foliis subtus vel bracteis strigosis cartilagineis

vel dense papillatis.

子房、蒴果平滑，叶背或苞片具软骨质粗糙柔毛或叶背密具乳突。

系的模式：粗糙黄堇 *C. scaberula* Maxim.

14. 察隅紫堇 “叭吓呷” (藏语) 新种 图 6, 1—6

Corydalis tsayulensis C. Y. Wu et H. Chuang, sp. nov.

In habitu species *C. trachycarpae* Maxim., videtur proxima, a qua differt foliis subter dense papillatis, floribus caesiis minoribus (1.8—2.2 cm longis), calcaribus cylindraces, petalis inferioribus basi minute saccatis, capsulis ovariisque laevibus.

Herba erecta, 40—50 cm alta. Radix ignota. Caules robusti, angulares, superne ramosi inferne nudi basi attenuati. Folia basalia petiolis circ. 20 cm longis, supra robustis, basi attenuatis, laminis ambitu ovatis, circ. 8 cm longis, tripinnatisectis, segmentis primariis 3—jugis, oppositis, petiolulatis, secundariis 2—jugis, suboppositis, breviter petiolulatis, tertiariis subsessilibus, partitis vel lobatis inaequalibus, ultimis anguste ellipticis vel anguste obovatis, apice obtusis, supra viridibus, subter cinereoviridibus, dense papillatis subhyalinis; caulina 3—4, ad caulem superne alterna, breviter petiolata vel subsessilia, ceterum basalibus similia, sed minora. Racemi terminantes, circ. 8 cm longi, floribus circ. 20, laterales pauciflori, primo dense post demum laxe dispositis; bracteae pinnatae, raro summa subintegra; pedicelli paullo robusti, bracteis breviores. Flores caerulei, horizontales; sepala squamiformia, sursum lacera; petalum superius 1.8—2.2 cm longum, limbo scaphoideo-ovato, ad marginem medio auriculato semiorbiculato, dorso cristato, crista circ. 1 mm alto, calcaris cylindrico, limbis duplo longiore, paullo attenuato, ad finem orbiculato; petalum inferius cymbiformi-oblongum, 0.8—0.9 cm longum, ad marginem praeter apicem inciso-serratum, crista petalo superiore aequilonga, medio paullo consticta, basi minute saccata; petala interiora 0.7—0.8 cm longa, limbis oblongis, sacculis lateralibus, cristis altis unguibus sublinearibus, modo dimidiis limborum longis; stamina 0.5—0.6 cm longa, antheris parvis, filamentis anguste lanceolatis, appendice 2/5 calcaris pererrente; ovarium anguste ellipticum, circ. 0.3 cm longum, ovulis paucis, uniseriatis, stylo gracili; ovario subaequilongo, stigmate binato obovato. Capsula obovato-oblonga, circ. 1 cm longa et 0.3—0.4 cm crassa, seminibus 6—8. Semen suborbiculata, nigra, nitida, biserialia.

西藏 (Xizang)：察隅 (Zayü)，青藏队 (Qinghai-Xizhan Exp.) 73—477 (模式！藏昆明植物所, Typus! KUN.)；芒康 (Markam)，吴征镒 (C. Y. Wu) 4541；八宿 (Baxoi)，青藏队 (Qinghai-Xizang Exp.) 73—1159；江达 (Jomdo)，萧培根 (P. K. Hsiao) 1354。

分布于西藏东部，生于海拔3700—4100米的草丛中或林缘。

本种外貌似糙果紫堇 *C. trachycarpa* Maxim., 但本种叶背密被乳突, 花淡蓝色, 较小 (长1.8—2.2厘米), 距圆筒形, 下花瓣下部略呈囊状; 蒴果和子房平滑。

15. 林生紫堇 新种 图 6, 7—8

Corydalis nemoralis C. Y.

Wu et H. Chuang, sp. nov.

Species similis *C. tsayulensis* C. Y. Wu et H. Chuang, sed calcaribus declinatis, petalis inferioribus inferne absque saccatis; seminibus 2—4, uniseri alibus differt.

Herba erecta, circ. 60—80 cm alta. Pars basalis plantae non visa. Caules paullo graciles, superne ramificantes, inferne nudi, prope basin angustati. Folia caulina 3—4, inferiora petiolata, summa sessilia, laminis ambitu late ovatis, tripinnatis, segmentis primariis petiolulatis, distantis, secundariis subsessilibus, ultimis anguste ellipticis vel oblanceolatis, supra viridibus, subtus dense papillatis subhyalinis. Racemi terminantes, 6—8 cm longi, sub fructibus ad 10

cm longi, floribus 12—25, laxe dispositis, bracteae flabellato-pinnatae, segmentis oblongis, summa oblanceolata, margine incisa, pedicelli bracteis paullo breviores. Flores pallide caerulei vel violacei, sepala squamiformia, margine lacerata, cauduca, petalum superius 1.6—1.8 cm longum, limbo naviculiformi-ovato margine auriculato semiorbiculato, dorso cristato circ. 1 mm alto, calcaris cylindrico, fere 3/5 totius petali occupante, ad extremum orbiculato, leviter decurvo, petalum inferior naviculiformi-oblongum, 0.6—0.7 cm longum, petala interiora panduriformia, 0.5—0.6 cm longa, limbis obovatis, lateraliter sacculis, unguibus anguste cuneatis, limbis brevioribus; stamina 0.4—0.5 cm longa, antheris minimis, filamentis anguste lanceolatis, appendice 1/2 calcaris percurrente, ovarium



图 6 1—6. 察隅紫堇 *Corydalis tsayulensis* C. Y. Wu et H. Chuang, 1. 植株; 2. 花外形; 3. 果; 4. 雌蕊; 5. 雄蕊; 6. 叶背部分放大。

7—8. 林生紫堇 *Corydalis nemoralis* C. Y. Wu et H. Chuang, 7. 花外形; 8. 果。

9—10. 黄绿紫堇 *Corydalis temolana* C. Y. Wu et H. Chuang, 9. 花外形; 10. 果。 (肖溶 绘)

anguste ellipticum, circ. 0.2 cm longum, ovulis paucis, uniserialibus, stylo gracile, ovario longiore, stigmatibus binatis obovatis. Capsula obovato-cylindrica, 0.5—0.8 cm longa et circ. 0.2 cm crassa, seminibus 2—4, suborbiculatis, nigris, nitidis, uniseriatis.

西藏 (Xizang) : 察隅 (Zayü), 王启无 (C. W. Wang) 65562, 65835 (模式! 藏北京植物所, Typus! PE.)

分布于西藏东南部, 生于海拔3400米左右的林下。

本种近察隅紫堇 *C. tsayulensis* C. Y. Wu et H. Chuang, 但距向下弧曲, 下花瓣下部不为囊状, 种子 2—4 枚, 1 行排列与之区别。

16. 黄绿紫堇 “抓桑” (江达藏名) 新种 图 6, 9—10

Corydalis temolana C. Y. Wu et H. Chuang, sp. nov.

Species similis *C. tsayulensi* C. Y. Wu et H. Chuang, sed floribus luteo-viridibus, minoribus, petalo inferiore basin versus calcar minore pendune, capsulis seminis 2—3 uniserialibus differt.

Herba erecta, circ. 40 cm alta. Radix ignota. Caules 1—2, teres angulati, superne ramosi inferne nudi basi filamentosi. Folia basalia petiolis circ. 15 cm longis, eis gracilibus, prope basin attenuatis, laminis triternatis, segmentis primariis sectis petiolulatis 3—4 cm longis, secundariis petiolulatis 0.3—0.5 cm longis, tertiariis sessilibus, integris vel medio segmentis 2—3-partitis, ultimis anguste ellipticis vel lanceolatis, apice acutis, supra atrovirentibus, subter cinereo-viridibus, dense papillatis subhyalinis, caulina 3—4, ad caules superne medio alternantia, inferne petiolata, summa sessilia, cetero basalia similia. Racemi multi, terminantes 2—8 cm longi, dense multiflori, bracteae infimae foliis caulinis superioribus similes, inferiores flabellato-pinnatae, superiores pinnatae, lobata lineares, summa lanceolata integra, pedicelli graciles, bracteis paullo breviores. Flores luteo-virides, horizontales; sepala squamiformia, margine lacera, alba; petalum superius circ. 1.7 cm longum, limbo naviculiformi-ovato, margine auriculato semiorbiculato, dorso cristis circ. 1.5 mm altis, quibus margine repandis inaequalibus, calcar cylindraceo, versus fines paullo attenuato, 3/5 totius petalorum occupante; petalum inferius cymbiformi-oblongum, circ. 0.8 cm longum, crista petalo superiore humiliore, basin versus calcar minore pendente; petala interiora circ. 0.7 cm longa, limbis obovatis, sacculis lateraribus, unguibus anguste cuneatis, limbis brevioribus; stamina circ. 0.6 cm longa, antheris minimis, filamentis lanceolatis, appendice 1/2 calcaris percurrente; ovarium ellipticum, 0.2—0.3 cm longum, 2—3-ovulum, stylo gracile, ad apices curvo, ovario paullo longiore, stigmatibus binatis obovatis, supra 2-papillatis. Capsula anguste elliptica vel anguste obovato-elliptica (immatura), circ. 0.5 cm longa, circ. 0.2 cm crassa, seminis 2—3, uniserialibus.

西藏 (Xizang) : 察隅 (Zayu), 吴征镒 (C. Y. Wu) 5216 (模式! 藏昆明植物所, Typus! KUN.)。

分布于西藏东南部, 生于海拔5000米左右的草甸。

本种近察隅紫堇 *C. tsayulensis* C. Y. Wu et H. Chuang, 但花较小, 黄色带绿, 下花瓣基部通常具1下垂的小距, 蒴果具2—4枚种子, 排成1行。

17. 甘草叶紫堇

Corydalis glycyphyllos Fedde in Fedde Rep. 20:354, tab. 8. A. 1924 et 26:176. 1929; Rehd. et Kobuski in Journ. Arn. Arb. 14:15. 1933; Fedde in Engl. et Prantl. Pfl.-fam. Aufl. I /17b:129. 1936. — *Corydalis melanochlora* Maxim. var. *pallescent* Maxim. in Mel. Biol. 10:27. 1877 et Fl. Tangut. 1:39. 1889.

四川: 康定, 蒋兴馨36632, 胡文光10720, 刘振书1258、1259、1291, 关克俭、王文采1085; 小金, 四川植物标本9729; 大金, 李馨77934; 泰宁至毛牛, 曲桂龄7510; 马尔康, H. Smith 4348。

分布于四川西北部和西部、西藏东部, 生于海拔4200—5100米的高山草地或流石滩。模式标本采自马尔康的马塘。

18. 粗糙黄堇

Corydalis scaberula Maxim., Fl. Tangut. 1:40, tab. 24, fig. 1—11. 1889; Rehd. et Kobuski in Journ. Arn. Arb. 14:15. 1933.

18a. 粗糙黄堇 (原变种)

var. *scaberula*

青海: 扎多, 刘尚武59。四川: 德格, 采集人不详7280; 色达, 伍典汉6606。西藏: 安多, 青藏队那曲分队10787, 秦志业1009、10411; 昌都, 青藏队植被组, 无号; 江达, 钟补求5180、5196、5197。

分布于甘肃西部、青海南部、四川西北部、西藏东北部, 生于海拔4500—5300米的高山流石滩或高山草地。

18b. 分枝粗糙黄堇 “多勒什勒巴” (藏语) 新变种

var. *ramifera* C. Y. Wu et H. Chuang, var. nov.

Differt a var. *scaberulae* Maxim. plantis supra ramosis, bracteis subtus cum marginibus dense pubescentibus albo-cartilagineis munitis.

与原变种的区别在于植株上部具数条分枝, 苞片背面及边缘密被白色软骨质粗糙柔毛。

四川 (Sichuan) : 甘孜 (Garze), 四川植物标本 (Sichuan plant spec.) 甘11—143 (模式! 藏四川生物所, Typus! CDBI.)。

分布于四川西北部, 生于海拔4900米左右的高山流石滩上。

18c. 紫花粗糙黄堇 新变种

var. *purpurescens* C. Y. Wu, var. nov.

A var. *scaberula* Maxim. differt floribus rubidis lutescentibus.

与原变种的区别在于花红色带黄。

四川 (Sichuan)：金川 (Jinchuan)，李馨 (S. Li) 77934。西藏 (Xizang)：丁青 (Dengqen)，青藏队植被组 (Qinghai-Xizang Exp. Veg.) 9357 (模式！藏北京植物所生态室，Typus！PE. -Veg.)

分布于四川北部、西藏东北部，生于海拔4750—5000米左右。

附：分种检索表

1. 子房、蒴果具多数小瘤排列成6条纵纹；距圆锥形，明显长于花瓣片；苞片长于花梗。(系1.糖果紫堇系Ser. *Trachycapae* C. Y. Wu et H. Chuang)
 2. 花紫色。
 3. 花较大，上花瓣长2.5—3厘米，外花瓣鸡冠状突起高而显著……………1.糖果紫堇 *C. trachycarpa* Maxim.
 3. 花较小，上花瓣长1.6—1.8厘米，外花瓣鸡冠状突起较狭，不显著……………2.灰岩紫堇 *C. calcicola* W. W. Smith
 2. 花黄色或白色。
 4. 花黄色，上花瓣长约3厘米，下花瓣下部不呈囊状……………3.高山紫堇 *C. alpigena* C. Y. Wu et H. Chuang
 4. 花白色，上花瓣长约2.5厘米，下花瓣下部呈囊状……………4.白穗紫堇 *C. leucostachya* C. Y. Wu
1. 子房、蒴果通常光滑(有的种个别植株偶有纵向小瘤)。(系2.平果紫堇系Ser. *Kokianae* C. Y. Wu et H. Chuang)
 5. 叶片背面光滑。
 6. 花较小，上花瓣长不超过2厘米。
 7. 花兰色、紫红色或颜色多变。
 8. 棒状根无柄；蜜腺体贯穿距的1/2。
 9. 茎具分枝，茎生叶1—3枚；花梗长于苞片；花兰色……………5.狭距紫堇 *C. kokiana* Hand. -Mazz
 9. 茎不分枝，茎生叶仅1枚；花梗与苞片近等长；花颜色多变……………6.变色紫堇 *C. varicolor* C. Y. Wu
 8. 棒状根具长柄；蜜腺体贯穿距的1/3；花紫红色……………7.洛隆紫堇 *C. lhorongensis* C. Y. Wu et H. Chuang
 7. 花淡黄白色，距长于或短于花瓣片。
 10. 棒状根无柄，距略短于花瓣片，内花瓣先端兰紫色……………8.黑顶紫堇 *C. nigro-apiculata* C. Y. Wu
 10. 棒状根具长柄，距长为花瓣片的2倍，内花瓣无紫色先端……………9.密穗黄堇 *C. densispica* C. Y. Wu
 6. 花较大，上花瓣长2.5厘米以上，距长为花瓣片的2倍。
 11. 植株较纤细，花序多花，排列稀疏，花深紫色，下花瓣下部不呈囊状……………10.紫花紫堇 *C. porphyrantha* C. Y. Wu
 11. 植株较粗壮，花序多花，排列密集，下花瓣下部呈囊状。
 12. 花兰紫褐色，外花瓣鸡冠高不足0.5毫米，子房有时具多数小瘤，但很快就脱落……………11.拟昌都紫堇 *C. deflexi-calcarata* C. Y. Wu
 12. 花黄色，外花瓣鸡冠高1—2.5毫米。
 13. 花黄色，距圆锥形，外花瓣鸡冠高1—1.5毫米，内花瓣无深紫色的先端……………12.昌都紫堇 *C. chamdoensis* C. Y. Wu et H. Chuang
 13. 花淡黄近白色，距圆锥形，外花瓣鸡冠高2—2.5毫米，内花瓣具深紫色的先端；蒴果、子房有时纵具小瘤……………13.淡花黄堇 *C. octocornuta* C. Y. Wu

5. 叶片背面或苞片边缘常具软骨质粗糙柔毛, 或叶背密具乳突。(系 3 糙叶紫堇系 Ser. *Scaberulae* C. Y. Wu et H. Chuang)

14. 叶片背面密具乳突; 距占上花瓣长的 $2/3$ 。

15. 花淡兰色, 下花瓣基部无小距。

16. 下花瓣下部略呈囊状; 种子 6—8 枚, 2 行排列 14. 察隅紫堇 *C. tsayulensis* C. Y. Wu et H. Chuang

16. 下花瓣下部不呈囊状; 种子 2—4 枚, 1 行排列 15. 林生紫堇 *C. nemoralis* C. Y. Wu et H. Chuang

15. 花黄色带绿, 下花瓣基部具 1 小距; 种子 2—3 枚 16. 黄绿紫堇 *C. temolana* C. Y. Wu et H. Chuang

14. 叶片背面沿脉或苞片边缘常具软骨质粗糙柔毛; 距短于或等长于花瓣片。

17. 花大, 紫色, 距与花瓣片近等长, 自中部向下直角弯曲 17. 甘草叶紫堇 *C. glycyphyllos* Fedde

17. 花较小, 淡黄色, 距短于花瓣片, 稍下弯 18. 粗糙黄堇 *C. scaberula* Maxim

三、地理分布

糙果紫堇组是我国特有的类群。共 18 种, 集中分布于甘肃西部和南部、四川西部、云南西北部、西藏东部和东北部, 大约北纬 27° — 40° , 东经 91° — 103° 之间, 即集中分布于青藏高原的东缘, 南起云南的丽江, 个别种北达甘肃的嘉峪关, 少数种沿西藏北部延伸至高原内部, 最西达安多, 其中四川西部、云南西北部、西藏东部最为密集, 在喜马拉雅地区绝无本组植物。它们大多生长在海拔 2700—5300 米的林下, 灌丛下高山草甸或流石滩。

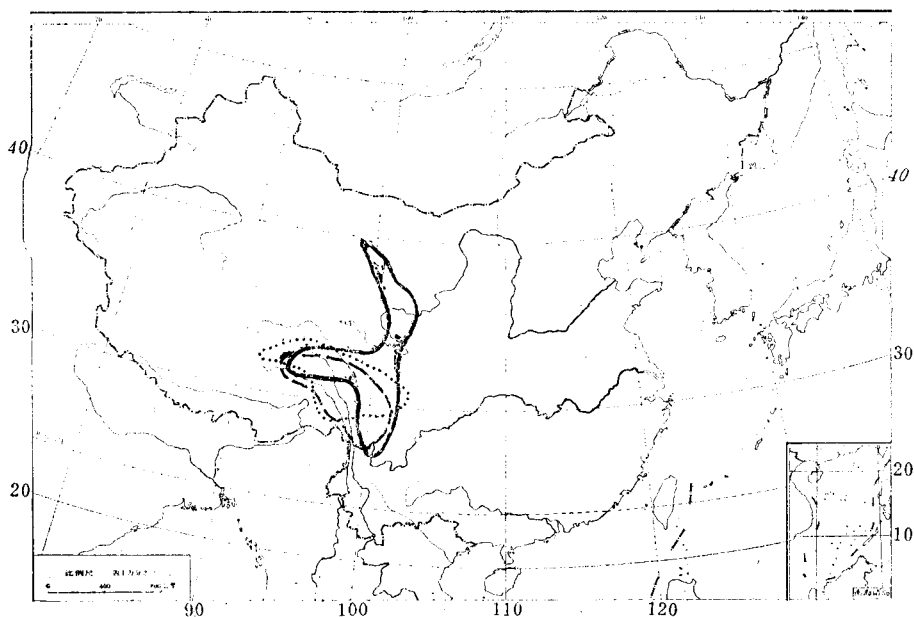


图 7 糙果紫堇组 Sect. *Trachycarpae* Fedde 分布图

Ser. 1. *Trachycarpae* — ; Ser. 2. *Kokianae* ---; Ser. 3. *Scaberulae*

从分布图中可见，三个系的分布区是重叠交错的。糙果紫堇系 (Ser. *Trachycarpae* C. Y. Wu et H. Chuang) 分布范围最广，且有着明显向北分布的趋势；糙果紫堇 (*C. trachycarpa* Maxim.) 是本组植物中分布最广的，它遍及本组分布区的五个省，垂直跨度也最大；与它极邻近的灰岩紫堇 (*C. calcicola* W. W. Smith.) 是最南分布的种，特产于云南丽江，其花显著变小，鸡冠状突起也不显著了；高山紫堇和白穗紫堇 (*C. alpigena* C. Y. Wu et H. Chuang et *C. leucostachya* C. Y. Wu) 是新发现的 2 个种，前者是在青海东部和南部、四川西北部新分化的黄花种类，后者则是产于青海的白花种类。平果紫堇系 (Ser. *kokianae* C. Y. Wu et H. Chuang) 以狭距紫堇 (*C. kokiana* Hand. -Mazz.) 为代表，组成一自然的分类群，它们以子房、蒴果平滑及叶片光滑分别与另二个系相区别，这个系的分布集中在组的分布中心内，显著的特点是分化最为强烈，全系 9 种中有 8 个新种；狭距紫堇在青海的替代种是花色多变的变色紫堇 (*C. varicolor* C. Y. Wu)，而在西藏则分化出洛隆紫堇 (*C. lhorongensis* C. Y. Wu et H. Chuang)，黑顶黄堇 (*C. nigro-apiculata* C. Y. Wu) 和密穗黄堇 (*C. densispica* C. Y. Wu) 是分布最广的 2 个新种，前者偏北（青海南部、四川西北部、西藏东北部），后者向南（四川西南部、云南西北部、西藏东南部），淡花黄堇 (*C. octocornuta* C. Y. Wu) 在西藏东北部分布稍广，其余 3 个种分布区都很狭窄，各自局限于四川、云南、西藏的局部地区；本系中的淡花黄堇和拟昌都紫堇 (*C. deflex-calcarata* C. Y. Wu) 个别植株也出现子房和蒴果具纵向小瘤的特征，说明种间、类群间都存在明显的过渡。糙叶紫堇系 (Ser. *Scaberulae* C. Y. Wu et H. Chuang) 的分布略向西，在青海和云南都没有分布；察隅紫堇 (*C. tsayulensis* C. Y. Wu et H. Chuang)、林生紫堇 (*C. nemoralis* C. Y. Wu et H. Chuang) 和黄绿紫堇 (*C. temolana* C. Y. Wu et H. Chuang) 就植株体态来看极为相似，分布区也同在西藏东部，但它们各自的特征是显著的，黄绿紫堇具黄色带绿的花瓣，下花瓣基部具 1 下垂的小距，而前 2 种下花瓣及果实的特征则完全不同；甘草叶紫堇 (*C. glycyphyllos* Fedde) 和粗糙黄堇 (*C. scaberula* Maxim.) 的分布区自四川西北部水平向西扩展，生长在海拔 4200—5300 米的流石滩或草甸上，它们植株都较矮小，叶片或苞片具软骨质的糙毛等特征，便是对高海拔环境适应的结果。

从上述分析可看出，本组植物集中分布在横断山脉北段，而类群间和种间的显著差异及明显的过渡，又说明它们仍在激烈分化繁衍，可见横断山脉北段是本组植物的分布和分化中心。

STUDY OF GENUS *CORYDALIS* SECT. *TRACHYCARPAE* FEDDE

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Abstract

Sect. *Trachycarpae* Fedde of *Corydalis* Vent. is an endemic group in China. They are mainly characterized by having fibrous roots of the thickened, fleshy, clavate and no leaf on the lower stems which gradually become linear towards the base and a few basal leaves possessing long petioles. In this section there are eighteen species all told. It is divided into three series according to their respective different characteristics, they are: Ser. 1. *Trachycarpae* C. Y. Wu et H. Chuang, Ser. 2. *Kokianae* C. Y. Wu et H. Chuang, Ser. 3. *Scaberulae* C. Y. Wu et H. Chuang.

This section is concentrately distributed on the west and south of Gansu, the west of Sichuan, the northwest of Yunnan, the east and northeast of Xizang, about between 27° – 40° N and 91° – 103° E, namely concentrately distributed on eastern margin of Qinghai-Xizang Plateau, it is in the west of Sichuan and the northwest of Yunnan and the east of Xizang that they get the most concentration.

The areas of three series are intricately overlapping, among which the area of Ser. 1. *Trachycarpae* C. Y. Wu et H. Chuang is the widest in this section, and it has distinct tendency of northward distribution; The outstanding characteristics of Ser. 2. *Kokianae* C. Y. Wu et H. Chuang are differentiated very violently, eight out of the nine species of this series are new ones and it is distinct that the interspecific as well as intertribal transition is present; The area of Ser. 3. *Scaberulae* C. Y. Wu et H. Chuang is westwardly inclined, they grow at the highest altitude (4200–5300 m.), it is characteristic that their leaves or bracts are provided with cartilaginous hair and so on, this is the result of the adaptation to the natural environments of the high plateau.

After all, Section *Trachycarpae* Fedde is concentrately distributed on the north part of Hengduan Mountains, while interspecific and intertribal conspicuous variances and transitions have indicated that they are still being differentiated and multiplied, it is thus clear that the north part of Hengduan Mountains is the center of distribution and differentiation of this section.